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INFORMATION ABOUT ALASKA

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Alaska embraces about 570,000 square miles of territory. There are three climatic belts known, respectively, as the coast region, the interior, and the arctic.

COAST REGION

This belt extends from the southern boundary of Alaska, latitude 54° 40', longitude 131° W., to the Seward Peninsula, which lies at the entrance to the Arctic Ocean. There is great variation in precipitation throughout this belt, as is shown by the figures given in the tables. Beginning with the most southern places for which there are records and following the coast line to Nome, the average annual precipitation, including melted snow, and also the mean and extremes of temperature from the warmest to the coldest during the same period of years, may be noted.

Table 1.—Average annual precipitation¹ and mean and extremes of temperature at various places in the coast region of Alaska

(By United States Weather Bureau)

Locality	Length	Average	Average	Temperature		
	of record	annual precipitation	annual snowfall	Mean annual	Maxim-	Minim-
	Years	Inches	Inches	°F	°F	°F
Ketchikan	18	157.97	36.7	44.8	96	-8
Juneau	35	81.25	110.0	42.2	89	-15
Skagway	22	25.74	43.1	40.4	92	-22
Killisnoo	28	52.79	85.8	40.7	84	-10
Sitka	61	83.48	48.2	43.9	87	-4
Cordova	17	144.79	145.2	40.3	87	-7
Valdez	19	52.73	257.8	35.4	84	-24
Seward	17	64.45	83.8	38.7	88	-20
Anchorage	13	14.80	69.1	33.4	82	-36
Kodiak	41	61.39	50.0	40.6	85	-12
Coal Harbor	15	48.51	57.2	39.1	80	-19
Dutch Harbor	15	63.69	(3)	40.0	80	5
Dillingham	15	27.12	53.9	33.7	89	-54
St. Paul Island	17	29.59	51.3	33.2	63	-26
Nome	22	17.26	58.6	25.4	80	-47

1/ Precipitation includes rain and melted snow.

2/ Minus sign indicates below zero.

3/ Insufficient data to give a fairly accurate average.

Table 2.--Average annual precipitation and mean and extremes of temperature at various places in the interior of Alaska

(By United States Weather Bureau)

Locality	Average:			Temperature		
	Length	annual	Average:	precipi-	annual	Mean
	of rec-			tation	snowfall	annual
	ord					
	Years	Inches	Inches		$^{\circ}$ F	$^{\circ}$ F
Allakaket	20	12.51	82.0	18.0	90	-70
Chitina	7	12.54	67.3	28.6	88	-58
Copper Center	16	9.15	39.6	26.1	96	-74
Eagle	27	10.71	51.3	24.1	95	-75
Fairbanks	24	11.39	44.6	26.2	99	-65
Holy Cross	26	20.05	85.3	27.1	87	-58
Matanuska	12	14.19	43.5	35.0	84	-34
Nenana	8	11.86	41.9	26.5	94	-63
Nulato	7	16.59	94.0	22.5	84	-62
Rampart	24	9.90	48.1	22.5	97	-68
Tanana	28	12.92	51.5	23.2	91	-76

1/ Minus sign indicates below zero.

Table 3.--Mean temperature for January and July at various places in the interior and in the coast region of Alaska

Locality	January		July	
	Length of record	Mean temperature ¹	Length of record	Mean temperature
Interior:				
Allakaket	12	-24.2	12	58.2
Chitina	5	-3.1	5	57.0
Copper Center	13	-11.5	14	56.3
Eagle	20	-15.6	18	59.2
Fairbanks	17	-15.3	17	60.7
Holy Cross	19	-4.2	18	56.1
Matanuska	4	7.1	5	56.9
Nenana	5	-12.8	5	61.7
Nulato	5	-10.6	4	56.5
Rampart	18	-19.8	17	61.0
Tanana	21	-15.8	18	58.9
Coast region:				
Ketchikan	10	29.1	11	57.4
Juneau	25	26.7	27	57.4
Skagway	17	19.1	15	58.3
Killisnoo	26	27.7	27	55.2
Sitka	39	31.7	40	54.8
Cordova	9	26.2	10	54.4
Valdez	12	17.5	12	53.6
Seward	12	20.5	14	55.6
Anchorage	5	6.8	6	56.0
Kodiak	22	28.7	24	54.5
Coal Harbor	20	28.0	21	52.6
Dutch Harbor	22	31.6	20	51.3
Dillingham	9	13.7	9	55.7
St. Paul Island	10	21.2	9	45.3
Nome	14	0.8	15	50.5

1/ Minus sign indicates below zero.

INTERIOR

As compared with the coast region the interior has a light precipitation, cold winters, and comparatively warm but short summers.

The noteworthy feature in the interior, as compared with the coast region, is the much lighter precipitation of rain and melted snow. While a drought is unknown in the coast region, it is not unusual for the interior to suffer from a period of dry weather. This drought usually occurs in April, May, and June, and is sometimes severe. The heavy precipitation of the coast region is conducive to a luxuriant vegetation. A heavy growth of grass is found wherever it is not crowded out by tree growth. The heavy rainfall enables spruce, hemlock, and cedar to

attain large size and to maintain a foothold on the steep mountain sides where there is but little soil. All forms of hardy garden vegetables thrive well in this coast belt, but grain growing is not a success. The rains keep grain crops green and growing beyond the period when they ought to mature, except in rare seasons which are drier than normal, and the fall rains usually prevent the farmer from saving his grain after it has matured. Except in a few limited areas, as for example, in the Haines country, where the rainfall is comparatively light, grain growing can not be made a success on the coast.

In the interior, on the other hand, the growth of native trees and shrubs is not so luxuriant, but more nearly approaches that of normal crops of grass and grain in the States. While the fall rains interfere with the curing of the crops, there is generally sufficient dry weather to harvest them without much loss.

Continued rains in the coast region frequently interfere with farm work. On the other hand, extreme cold weather of the winter in the interior, where the temperature sometimes falls to -65° F., or lower, makes life out of doors, both for man and beast, uncomfortable, but these periods of extreme cold are of brief duration. They do not affect farm work to any noticeable extent, because there is little outdoor farm work to be done at that time of the year. The summers are sometimes uncomfortably warm in the interior--the temperature at Rampart has occasionally reached 96° F., but these hot spells are also of short duration.

The precipitation above referred to includes both rainfall and melted snow, but snowfall varies greatly from year to year, as well as with the locality. In Prince William Sound, for instance, the snowfall is usually comparatively heavy, reaching at times as much as 20 feet or even more during the winter; but in southeastern Alaska, on the other hand, there is comparatively little snow.

In the interior the snowfall varies in like manner with local conditions. At Rampart and Fairbanks the normal snowfall is about 4 feet. Snow begins to fall in October and gradually accumulates during the entire winter until the total amount measures between 3 and 4 feet. There is sometimes a thaw in January, which seldom lasts long enough, however, to melt the snow from the ground. A comparatively heavy snowfall is a decided advantage to the farmer because it protects his winter crops from the effects of extremely low temperatures.

From the standpoint of health the Alaska climate is exceptionally favorable. The air is pure and bracing. The winds sweep over the sea, virgin forests, or snow-covered mountains. They carry no contaminating disease germs. In general, the native Indians, due to their insanitary modes of life, suffer from tuberculosis and from an occasional epidemic of smallpox; but the white population is more exempt from such diseases as pneumonia, grippe, and typhoid than in the States. Men who are much exposed to the weather sometimes contract rheumatism, and stomach troubles occasionally result from a too prolonged unvaried diet of canned foods.

THE ARCTIC

The climate of the Arctic region is unfavorable to the growth of farm crops. Although the total annual precipitation is only 5 to 10 inches, the tundra regions are wet throughout the summer. The mosses and lichens abounding in the region form an insulation and keep the ground perpetually frozen, except for some few inches below the surface for several months in summer. Many thousands of wild caribou roam over the region. These animals will undoubtedly be replaced in the future by reindeer, which are now rapidly increasing in Alaska. Remarkable yields of hardy vegetables, including cabbage, carrots, turnips, rutabagas, and potatoes, have been produced on land having southern exposure in small isolated places.

COST OF LIVING

The cost of living in Alaska is somewhat higher than it is in the States owing to transportation charges. This is offset, however, by the higher prices which the farmers in Alaska receive for their products.

Capital required by the new settler should be sufficient to provide him with living expenses for a year or longer if he settles on new land. The minimum recommended is \$2,500 per family.

HOW TO OBTAIN A FARM

Most of the farms in Alaska are acquired in two ways: By homesteading and by purchase. The homestead laws require, among other conditions, the following:

"That the land be agricultural in character.

"That persons who are not citizens of the United States, or who have not declared their intention of becoming citizens, can not make an entry.

"That the homesteader must establish residence within six months from the date of taking up the homestead and must continue to maintain that residence for at least seven months of each of three years.

"That one-sixteenth of the area included within the homestead must be cultivated within the first two years after the homestead is taken, and one-eighth cultivated before the end of the third year. The Secretary of the Interior is authorized to reduce the requirement upon the presentation to him of a satisfactory showing of the reasons for the homesteader's failure to comply with the law.

"That a habitable house must be erected on the land.

"That proof of having fulfilled homestead requirements must be submitted within five years from the date of entry. At the end of 14 months continuous residence and the cultivation of one-sixteenth of the land, the homesteader may submit commutation proof on his entry and may secure patent to the land upon payment for it at the rate of \$1.25 per acre.

"That at the time the homesteader makes his entry he is to pay an entry and commission fee of \$16.

"That at the time he makes final proof he is to pay a testimony, commission, and advertising notice fee totaling about \$20."

Further information may be obtained by writing to the General Land Office, United States Department of the Interior, Washington, D. C., or at Anchorage, Alaska, for Circular No. 541, entitled "Suggestions to Homesteaders and Persons Desiring to Make Homestead Entries."

Farms are also obtainable through purchase from homesteaders. Farms with some buildings and 160 acres of land--a part of which has been cleared--may be obtained at \$1,000 to \$2,000 each. These farms are now owned by homesteaders who are too old and feeble to work the land.

THE NATIONAL FORESTS

The national forests in Alaska comprise land that is nonagricultural in character. Limited areas at the heads of bays and on the mountain sides are utilized for farming. In general, the relief is too rough and the rainfall too heavy to make the growing of farm crops a success. Berries and vegetables grow luxuriantly in home gardens of very limited area on cleared land in the national forests.

A recent act of Congress made it possible for persons who are primarily engaged in some work other than farming to obtain a 5-acre tract in the national forests for the purpose of building a home. A number of fishermen, miners, laborers, and others have taken advantage of this new law. To obtain title these homesteaders are not required to clear more land than is sufficient for a building site.

Only settlers who take up land within the national forests can take advantage of the privilege of cutting timber in the national forests. They may cut without charge or permit such timber from their claims as is necessary to clear their land for cultivation and to construct their farm improvements. They may also avail themselves of the privilege granted settlers, miners, prospectors, and others, of taking free of charge 10,000 board feet of saw timber and 25 cords of wood per year from the national forests for their personal use. No permit is required except for green saw timber. In case additional timber is needed for domestic use, they can purchase mature dead and down material which can be cut without injury to the national forest at the actual cost to the Forest Service of making and administering the sale. Settlers on agricultural land in the interior can not take advantage of these privileges. It is more economical for them to cut timber on the public domain or to buy their lumber.

TAXATION

Land or property outside of incorporated towns is at present not subject to taxation in Alaska. All male settlers between the ages of 21 and 50 years are required to pay a school tax of \$5 per annum. The funds of the Territory are raised by licensing certain industries including fisheries, cold-storage plants, and mining. A settler who owns an automobile which is operated purely for pleasure or for family use is required to pay the Territorial automobile license fee of \$10. Automobiles equipped with truck bodies for use on farms are exempted from taxation.

FISHING AND HUNTING

Fishing and hunting in season afford the settlers healthy recreation and considerably reduce the cost of living. Most of the lakes and streams are alive with trout, grayling, and whitefish, and the larger streams supply salmon. Moose are often found near settlements, and caribou are plentiful in the Tanana Valley during the migrating period. Wild fowl such as ducks and geese are numerous in the early fall, but move south as winter approaches. Ptarmigan, grouse, and rabbits are frequently found in large numbers, but during occasional years they are scarce.

For information regarding the game laws of the Territory, apply to the Alaska Game Commission, Juneau, Alaska.

REINDEER PRODUCTION IN ALASKA

Reindeer production is rapidly becoming one of the important industries of Alaska. The herds now numbering approximately one million animals are found chiefly in the coastal plains along Bering Sea. They are handled in much the same way as other range livestock but may also be fed on hay, grain, and root crops produced on farms. Allotment of range lands for grazing purposes is made under the direction of the governor of the Territory, Juneau, Alaska.

RAILROADS

The White Pass and Yukon route runs through American territory from Skagway to the summit of White Pass, 20 miles distant, and continues thence through Canadian territory to White Horse, 110 miles from Skagway.

A railway known as the Copper River & Northwestern has been built from Cordova on Prince William Sound to the copper mines at Kennecott. It is 197 miles in length.

A short line has been built from Yakutat for a distance of 20 miles, wholly for the purpose of tanning salmon streams and for the conveyance of salmon to the fish cannery at Yakutat.

A railroad extends from Nome into the mining fields for a distance of 75 miles. This road has recently been acquired by the Government.

The Alaska Railroad from Seward to Fairbanks, completed in 1922 was built by the Government at a cost of approximately \$56,000,000. It skirts Turnagain Arm and Knik Arm to Anchorage, and thence follows the valley of the Matanuska, the Susitna, and the Tanana Rivers to Fairbanks. A branch line from Matanuska to Chickaloon taps the Matanuska coal fields. The Government has also acquired a privately owned line from Fairbanks to Chatanika, which serves the principal mining districts for a distance of 45 miles.

GENERAL INFORMATION

The Matanuska Valley offers opportunities for dairy-men, while the Tanana Valley is well adapted for grain growing and diversified farming. The land in the Matanuska Valley is covered with birch, spruce, and cottonwood in sufficient quantities

to permit of logging and sawmilling lumber for local consumption. Logs are sent to the neighboring sawmill and are cut into lumber for use in farm buildings. Wood for fuel is plentiful on nearly all the farms. Those who settle on cut-over land can obtain their wood from the public domain. Local sawmills are in operation in both the Matanuska and Tanana Valleys. The Tanana Valley is timbered with birch on the hillsides, and spruce and birch in the valley proper, with spruce predominating.

The Matanuska Land Clearing Association was organized in 1929 for the purpose of aiding its members in clearing new land.

The various advantages and conveniences offered in towns of the same size population in the States are to be had at Fairbanks, in the Tanana Valley, and at Anchorage, in the Matanuska region. Each town has its high school, daily newspaper, hospital, banks, general merchandise, drug, and furniture stores, and meat markets, restaurants, and hotels. There are doctors, dentists, and lawyers in each town.

A flour mill is located at Fairbanks.

A creamery, established at Curry, Alaska, in 1927, purchases cream for butter making at any shipping point along the Alaska Railroad.

Many of the towns have libraries and reading rooms. Fraternal orders also maintain good buildings and reading rooms.

Settlers should purchase new machinery for shipment to Alaska. The freight rate on second-hand machinery is nearly as high as that on new machinery.

Cars carrying livestock to Alaska should be provided with water barrels so that the animals can be watered en route. Cattle must be tested for tuberculosis and horses for glanders before they are placed on board ship at Seattle. During some of the summer months livestock suffer considerably from mosquitoes, especially when pastured on the lowlands. As the land is cleared, mosquitoes become less troublesome.

The telegraph lines in Alaska are owned by the Government. Wireless stations are rapidly replacing the cables which were laid to connect the ports on the coast of southern and southeastern Alaska. Wires are used along the Alaska Railroad but have been discontinued to all other regions in interior Alaska. Wireless stations are in operation at points widely distributed over the Territory.

Schools and Churches

The educational system of Alaska comprises four classes of schools, the municipal, the district, the rural, and the Federal schools. The first three mentioned are under the general supervision of a Territorial commissioner of education with headquarters at Juneau, and the last named is under the supervision of the Commissioner of Education of the United States Department of the Interior, Washington, D.C., with a branch office in Seattle, Wash. The system includes also the Alaska Agricultural College and School of Mines, Fairbanks, Alaska, whose affairs are administered by a board of trustees with the president of the college as chief executive officer.

Municipal schools are accredited high schools and grade schools in incorporated towns. The school curriculum in general is similar to that which characterizes schools of similar size throughout the Nation.

District schools are schools outside of incorporated towns, but in a regular school district, and require a minimum enrollment of 10 children of school age. These schools are maintained entirely by the Territory.

Rural schools are special schools which are maintained in communities where the number of children is less than is required by law for the establishment of a school district. Rural schools are operated on a cooperative basis, the community receiving the benefits of the school being required to provide the building and in most instances at least a part of the fuel.

Federal schools are maintained by the Federal Government, and are for the benefit of the Eskimos and the Indians of Alaska. These schools are vocational.

The Alaska Agricultural College and School of Mines is a land-grant institution and is supported by the Federal Government supplemented by appropriations made by the Territorial Legislature. The college is exceptionally well equipped and offers courses leading to degrees in agriculture, business administration, chemistry, civil engineering, general science, home economics, mining engineering, geology, and mining and metallurgy. In addition, short courses are offered annually in agriculture, home economics, and mining. The faculty numbers 18 professors, including the president.

Towns with a population of 1,000 or more have churches of the larger denominations.

Where to Locate

Transportation and markets are the main determining factors in the settlement of any region. For the profitable marketing of crops settlers should locate near a town on a railroad. Any place along the Government railroad will enable settlers to keep in close contact with markets. If possible, the prospective settler should locate in a locality in which there are a sufficient number of other families to permit the organization of a school district. He should consider the advantages to be gained by locating near other settlers, because every settlement will in time be provided with stores, churches, schools, and other indispensable features of community life.

Agricultural Areas

Alaska is estimated to contain approximately 65,000 square miles of land which can be made available for agriculture. The principal productive areas are found in the Matanuska Valley, the Tanana Valley, the Kuskokwim Valley, and the Yukon Valley.

There is another considerable body of agricultural land north of the Tanana River, between the Tanana and Fortymile, and more particularly along the south Fork of the Fortymile River. It has been estimated to contain 760,000 acres. This will probably prove to be one of the most productive regions of Alaska when it becomes necessary to develop it.

Alaska is hilly, and only the gentler slopes are arable. There are no prairies such as characterize the middle-western United States. Practically every foot of soil has to be cleared before it can be put

under cultivation. In the coast region, as far west as Cook Inlet, there is a heavy growth of timber, and ordinarily it is too expensive to clear at this stage of development. West of Cook Inlet there is comparatively little timber, but, on the other hand, there is a wealth of small bushes and grass, and this region will therefore be chiefly suited to stock raising. The interior valleys are covered with timber and bushes, but of a much lighter growth than is found in the coast region. Clearing is therefore easier. The settler wherever he goes must clear the land of a more or less heavy growth of timber and bushes.

Matanuska Valley

Location.--The Matanuska Valley is located between parallels 61 and 62° north latitude and meridians 149 and 150° west longitude. It is bounded on the north by the Talkeetna Mountains, on the east and south by the Chugach Mountains, and on the west by the vast level plain of the Susitna River. The valley lies at the head of one of the arms of Cook Inlet about 125 miles in a direct line from the south coast of Alaska, and is traversed by the Alaska Railroad.

Climate.--The latitude of the Matanuska Valley gives it long winters, short summers, and a great variation in the length of day between winter and summer. About the summer solstice the sun is below the horizon for only a few hours, and during this time there is no real darkness. The climatic conditions are transitional between those along the coast and those in the interior. Grain can be grown as in the interior, but the winters are much milder and the growing season is longer. The climate is influenced principally by the relatively warm waters of the Pacific Ocean on the south, and the Alaska Range beyond the Susitna Plains on the west, the Talkeetna Mountains in the north, and the Chugach Mountains on the east. The moisture-laden winds from the Pacific Ocean through Cook Inlet sweep against the high mountains, and this in turn causes a precipitation of rain and snow over the entire region. The effectiveness of the mountains as barriers to the passage of moisture is indicated by the veil of fog and cloud that hangs so frequently over the southern slopes of the peaks in contrast with the prevailing clear atmosphere and cloudless skies of the northern slopes of the Alaska Range.

Under the modifying influence of the surface features and the warm coastal waters, the region has temperate summers, moderately cold winters, and a moderate rainfall. The climate is lacking in extremes of temperature and the light precipitation that characterizes the great interior valleys of the Yukon and its tributaries. The mountain ranges also protect the region against the fierce blizzards of the arctic regions. Because of the protection afforded this region by the mountains on all sides except for a narrow strip on the southwest occupied by Cook Inlet, long journeys may be taken at any time in the Matanuska Valley, a condition that does not prevail on the open continental plains in the United States much farther south. The region is free from tornadoes and severe electrical storms.

The spring and early summer have the lowest average precipitation, and July, August, and September have the heaviest rainfall. The normal low precipitation for the early summer is not usually detrimental to crop growth, as would be the case with scanty rainfall

in regions farther south, because the average low temperature and the rather weak sunlight result in a slow rate of evaporation. Notwithstanding the effect of these agencies, droughts of some severity have occurred in this region since farming was begun. The rainfall in the latter part of the summer comes for the most part in light showers with much cloudy weather. The weather is sometimes unfavorable for curing hay. At such times it is placed on racks or piled in cocks which are supported by thin vertical poles through the center to permit of drainage and the free passage of air.

The average frost-free period for the years 1923-1926, inclusive, was approximately from about May 15 to September 22, or 130 days. The north side of Knik Arm of Cook Inlet has a longer frost-free period than the south side. The growing season is as long as that of portions of the northern part of the continental United States, but the conditions are more favorable to crop production in the more northern section for the reason that the actual period of plant growth is greatly accelerated by the many hours of sunlight.

There are 14 hours of sunshine per day beginning April 15. The days gradually increase in length, May 15 having 17 hours of sunshine, and June 15 about 20 hours. For several weeks after June 15 there is practically no darkness. After June 22 the days begin to shorten, the decrease being at the same rate as was the increase before that date. The maximum and minimum temperatures during the growing season of 1928 were for April, 54 degrees and 9 degrees F., respectively; for May, 73 degrees and 25 degrees; for June, 84 degrees and 36 degrees; for July, 82 degrees and 38 degrees; for August, 71 degrees and 35 degrees; and for September, 61 degrees and 22 degrees.

The total annual rainfall ranges from about 12 to 20 inches. This precipitation is ample owing to the slight rate of evaporation and the fact that the period of drought is extremely short. Irrigation is not required in the Matanuska Valley. Grain crops are not harvested before the period of maximum temperature in summer, as is done in the large grain regions of the Mississippi Valley. The warmest temperature in midsummer is required for the growth of cereal crops which do not mature until later in the fall when the days are cooler again. At that time of the year there is usually much cloudy weather accompanied by light rains. Crops do not cure readily in the shock and are therefore used mainly in the form of silage.

Topography and soil.--The topography of the Matanuska Valley consists mostly of benches and lowlands with occasional irregular ridges. These benches and lowlands embrace a variety of soils ranging in composition from fine silt loam through fine sand to peat, and in drainage, from well-drained bench land to water-soaked marsh. To be put in readiness for cultivation, the greater part of the land requires to be cleared of timber, undergrowth, moss, and any other thick covering of vegetation that may be present.

Exclusive of muskeg and muck, there are two broad divisions of soil in the Matanuska Valley: (1) The bench-land soils, and (2), the stream-bottom soils. According to Bennett and Rice, the former division comprises mainly the Knik loam series and the soils represent material which evidently has undergone considerable attrition by water or glacial action, or both, mixed, especially in the surface portion, with varying quantities of volcanic matter.

Chemical analysis shows that all the soils have a good lime content; in fact, it is higher than is that of the average soil in the humid portions of the United States. The lime, however, is evidently present in combinations of low solubility, inasmuch as heavy applications of lime are required to correct acidity.

The region consisting of bench lands varying in width from 100 feet to several miles, constitutes a great irregular plain that is continuous except for the interspersion of connecting bodies of water and essentially uniform in its principal topographic characteristics. This plain rises through successively higher benches, steplike, from a few feet above high tide to a maximum elevation averaging probably 1,200 feet above sea level, where it merges with the flanking mountain slopes. The greater part of the bench land is probably about 25 to 200 feet above sea level. In some places the benches attain elevations of 2,000 feet.

Drainage.--Owing to the sandy and gravelly nature of the soils and subsoils, the bottom lands drain quickly. Probably 75 per cent of the bottom land is sufficiently well drained to admit of cultivation without ditching.

Large bodies of both extremely poorly drained land and well-drained land, also less important areas possessing intermediate drainage, and still others having excessive drainage, occur throughout the main part of the plain, in the nonalluvial portion. These varying moisture conditions are determined very largely by the position and character of soil materials.

The good agricultural lands, such as the benches, hillocks, and ridges, are largely occupied by the Knik loam soils, which mostly have well-established drainage even in localities far removed from streams. All these soils are gravelly in the substratum, and for this reason, possess as nearly perfect internal and downward drainage as is possible.

Ditching is not necessary except when it is desired to give an outlet to the lower depressions. The deeper loams such as the typical Knik loam hold sufficient moisture, especially with proper soil management, to meet the requirements of all crops in ordinary seasons. It is estimated that 75 per cent of the more valuable farming land of this region is well drained and capable of conserving ample moisture for crop needs.

Good water for domestic use is obtainable on all farms. Some farmers obtain their water from creeks, and others have to dig wells ranging from 15 to 60 feet deep.

Crops.--Cereal crops such as spring wheat, oats, and barley grow well in the Matanuska Valley. The yields per acre for the past six years have been 22 bushels for wheat, 51 bushels for oats, and 24 bushels for barley. Potatoes yield more than 200 bushels per acre on good soil. The usual time for seeding cereal grains is about May 15, and the harvesting time is about September 1. Growth during the period soon after seeding is usually comparatively slow owing to the dry weather. The moisture in the ground resulting from the melting snow is sufficient to germinate seed, and light showers later cause a rapid plant growth.

Oats are usually grown both as a grain and as a hay or silage crop. Varieties that mature early are preferable for grain even if they are not so tall or as high in yielding capacity as other varieties. Owing to the comparative coolness of the summer days the harvest usually begins after the warmest part of the summer has passed.

The main hay crop is vetch with only enough oats seeded in the mixture to prevent the former from lodging.

Oats and peas constitute the main silage crops. The oat varieties used require a longer number of days to mature than do oats which are grown for seed, the object being to obtain as much forage as possible. Canadian field peas are seeded in the mixture, which yields from 4 to 6 tons of silage material per acre on average soils. This crop is always dependable because it can be harvested in the immature stage and taken from the field regardless of weather conditions.

Spring wheats of the earliest types can be matured. Difficulty is sometimes experienced in curing the shocks in the field owing to the moist fall climate. There is little demand at present for spring wheat in the immediate neighborhood, but as soon as a sufficient quantity can be grown it will likely be shipped to Fairbanks for milling.

Barley has proved to be valuable as a grain feed. It grows well on all the upland soils and can be used as a forage and as a grain crop. As a grain crop it takes the place of corn for fattening hogs and cattle.

Winter rye can be grown successfully. It is sown the latter part of July and matures in August of the following year, occupying the field for two seasons.

The potato is probably the most important money crop. It yields heavily on all fertile and well-drained soils. Potatoes should not be planted on new land and wet soils because on these types of soils the tubers tend to be soggy when cooked.

Root crops like mangels, carrots, rutabagas, and sugar beets yield abundantly. These crops are used to supplement silage or to take the place of silage where the farmer is not equipped with a silo.

Peas for canning yield heavily. Climatic conditions apparently are especially favorable for growth of this crop.

The most important legumes grown by the farmers in the Matanuska Valley are field peas and annual vetches. Perennial legumes are not very successful since they are heaved out of light soil by frost in winter.

Livestock.--Successful farmers are centering their operations around dairying. A hardy breed of dairy cattle has been produced for the region by crossing the Holstein with a hardy strain of Galloway cattle. One of the crossbred animals produced more than 12,000 pounds of milk during one lactation period. In addition to being hardy, these cattle are good rustlers and are easily kept in good condition.

Hogs are raised on dairy farms and are given skim milk as a part of the feeding ration. Young pigs have been found to develop rapidly on pasture seeded to a mixture of rape (4 pounds), peas (1 bushel), and oats (1 bushel). This mixture will produce excellent feed for hogs all summer, provided not too many of them are kept in one area on such a pasture. The oats that have been pastured will send up new shoots and when the fall rains are frequent will continue to make vigorous growth, supplying excellent succulent feed until the plants are killed by heavy frosts in September or October.

Markets.--A market for cream has been established by the Alaska Railroad creamery in Curry, Alaska, since 1927. This creamery purchases at market prices all the cream that is obtainable from the region for butter making.

The potato market is usually good. Carrots grow well and can be marketed at points along the railroad.

Transportation.--The Matanuska Valley is traversed by the Alaska Railroad which extends from Seward to Fairbanks, a distance of 470 miles. A network of good wagon and automobile roads totaling 113 miles connects the towns of Matanuska, Wasilla, and Palmer with the farming regions. All these towns are on the Alaska Railroad. During the winter the ground is usually covered with snow to a depth of about 20 inches. Automobiles can be used during a part of the winter, but when the snow is too deep for their use traveling is done by sleighs. Dogs are not used as draft animals in this region.

Tanana Valley

Location.--The agricultural region known as the Tanana Valley is located approximately 240 miles directly north of Matanuska. It is between the parallels of 64° and 66° north latitude, and the meridians of 146° to 149° west longitude. The farming district comprises in a general way the area extending from Dunbar north about 10 miles, thence north-easterly to within a few miles of the Chathanika River, thence southeasterly, crossing the Little Chena River, to near the junction of the Salcha and Tanana Rivers, thence following about 2 miles south of the left limit of the Tanana River to its junction with the Chena River, crossing the latter and passing Ester Dome to the line of the Alaska Railroad, and thence in a westerly direction to Dunbar. It is the northernmost region available for agricultural settlement in Alaska at present.

Climate.--The frost-free period in this region extends from about May 15 to September 15. For the years 1911-1928, inclusive, the highest temperature recorded was 99° F. in July, 1919, and the lowest was -60° for a few hours in January, 1918. During the growing and maturing months beginning with May, the normal temperature shows a steady rise from 46° on May 15, to 60° on June 21. The normal average is maintained until July 15 when it begins to decline to 50° the last week of August, and to 45° September 15.

The winters are cold and during two months of lowest temperature the normal average ranges from -5° to -8° F. in December, and from -5° to -14° in January. The winter weather is healthful and invigorating, and the air is crisp and clear. The average annual snowfall for the past 17 years was 35 inches. Owing to lack of winds in this region the snow remains evenly distributed over the ground most of the time. It is usually light and feathery and remains in this condition for a large part of the winter.

During the growing season the days are long. On May 1 the sun rises at about 4 a.m., on June 1 at 2.30 a.m., on July 1 at 1.30 a.m., and on August 1 at 2 a.m. The sun sets on May 1 about 9.30 p.m., on July 1 at 10.30 p.m., and on August 1 at 10 p.m. During June and July and parts of May and August twilight is continuous throughout the short night.

The total precipitation ranges from 8 to 15 inches. Approximately two-fifths of the precipitation comes during the growing season. Since heavy rains rarely occur in this region, the harm done by erosion is almost negligible.

All the soils have a physical constitution that is well suited to the absorption and retention of rain. Owing to this fact and to the short periods of drought and the low rate of evaporation, cereal crops can be produced with as little as about 8 inches total precipitation.

Dry seasons may cause crops to suffer from lack of moisture, but do not effect any great diminution in the average yields. Dry weather in late spring and early summer sometimes checks plant growth to such an extent as to cause low yields, or subsequent moisture may prolong the growth and thus lessen the chance of maturity by increasing the danger of injury by frosts.

Drizzling rains and cloudy weather are common in the summer and may cause difficulty in curing hay. It is believed, however, that freshly cut vegetation does not deteriorate as rapidly in rainy weather as it does in the warmer climes. The presence of ground ice, which frequently begins within 8 to 40 inches of the surface and extends to great depths, does not have a deleterious effect upon crop production. On the contrary, it is thought to constitute an actual advantage because the thawing supplies more or less moisture to the growing crops.

Topography and soil.--Most of the land in the Tanana region is hillside or old river-bottom land. Hillsides with a southern exposure are considered to be the most desirable for farming because crops grown on them mature earlier than do those on river-bottom lands. The lowland soils are very productive and yield heavy crops of forage.

Crops.--The most important farm crops in the Tanana Valley are grain and potatoes. Oats are grown both for grain and for forage. Seeding is usually completed by June 1 and the crop is harvested by September 1. The average yield for oats ranges from 40 to 75 bushels per acre with an average of about 50 bushels.

Wheat gives an average yield of 20 to 25 bushels per acre. Early varieties are matured without difficulty. Only spring wheats are grown in this region.

Barley yields from 20 to 30 bushels per acre with an average of about 25 bushels. It grows well and the grain is an important crop for dairy cows.

Potatoes form the most important money crop and yield from 200 to 300 bushels per acre. In some years when the growing season is cool and short the crop is matured with difficulty unless it is planted on south-slope land.

Hardy vegetables for the home can be produced in the family gardens.

Alfalfa (*Medicago falcata*) endures the extremely cold winters without difficulty. The plants are short, however, and the yields are low. Other hardy types have been tried but have not been grown with entire success.

Livestock.--This region is also well suited to dairying. Summer pasture is available for four months of the year, and during the rest of the time livestock must be fed. Oats, barley, peas, vetch,

bluetop, and bromegrasses are all grown for winter feeding. Because of the cold winters all dairy barns should be built of logs and provided with artificial heat. Hogs can also be produced profitably in the Tanana Valley. During the summer they are pastured and in the fall they are fattened on barley.

Market.--The thriving town of Fairbanks is in the heart of this agricultural region. From here the mining camps within a radius of several hundred miles are supplied with provisions. Sixty miles from Fairbanks is the town of Nenana where products are sent for shipment by river steamboats down the Tanana and Yukon Rivers.

Transportation.--Fairbanks is the northern terminus of the Alaska Railroad. This railroad, which is owned by the Government, operates regular trains semiweekly throughout the year between Fairbanks, the largest town in interior Alaska, and Seward, a seaport on the southern coast. Two long automobile highways extend out from Fairbanks. One of them, known as the Richardson Highway, connects with Valdez, on Prince William Sound, and the other, known as the Steese Highway, connects with Circle, on the Yukon River. In addition, a network of good automobile roads totaling 128 miles traverses the vicinity of Fairbanks and connects with points on the Alaska Railroad.

Other Regions

Southwestern Alaska.--The agricultural regions of southwestern Alaska include the Alaskan Peninsula and the treeless islands beginning with the Kodiak-Afognak group, and extending westward to Attu Island.

At the lower elevation on the mountain sides several types of grasses and a dense growth of mosslike plants form a good range for cattle during the summer. Large areas of beach rye and sedge grasses at the heads of bays can be harvested for hay and silage by means of mowing machines where the areas are not cut too deeply by small streams. These grasses make dense growth and attain a height of about 4 feet.

Numerous attempts have been made to raise livestock on the islands beyond Kodiak Island, but nearly all have failed, principally because of the lack of inexpensive transportation. The distance from Seattle to Unalaska is more than 1,000 miles and can be covered in six days by direct route or in nearly two weeks via Seward. Freight charges for provisions are almost prohibitive because of the distance. Mail steamers beyond Kodiak arrive only once a month, and, obviously, fresh meats and vegetables are luxuries to the white persons living in these localities. The last steamship dock to the westward is at Unalaska. Harbors at the settlements are poor, and the sea in this region is heavy nearly every month of the year. Ranchers must provide themselves with small boats for transportation between their ranches and the nearest steamship dock, and traveling in small boats is not practical for more than 15 miles on the open ocean and should be attempted only on days of fair weather. When storms are too heavy, provisions and mail must remain aboard ship and be delivered a month later. The heavy waves would swamp small boats in their attempt to reach the mail steamer. The rancher who has only a small herd will therefore find it impractical to locate west of Kodiak Island before additional shipping facilities are provided.

Possibilities of livestock raising on a small scale are limited at present to the Kodiak-Afognak Island group. Large ocean-going vessels call at Kodiak on an average of once in two weeks throughout the year. Wagon roads radiate from Kodiak and from them trails extend to the bays where ranchers keep their herds at the present time. The animals are driven overland to Kodiak. Ranchers go to Kodiak overland, or on days of fair weather by water in small boats.

Kenai Peninsula.--The western part of the Kenai Peninsula between Cook Inlet and the Kenai Mountains comprises some of the best agricultural land in Alaska. The climate is never severe, being neither extremely cold in winter nor hot in summer. It is tempered by the warm winds from the Pacific Ocean, which is less than 100 miles to the south in a direct line. The same kinds of crops that are being produced in the Matanuska Valley can also be produced here. The area of good agricultural land is more extensive than that of the Matanuska Valley.

The region is destined to remain undeveloped until economic transportation facilities can be provided. On account of the shallow waters which border the shores of Cook Inlet, large ocean vessels must anchor from 3 to 5 miles out. Small boats go up the Kenai and Kusilof Rivers far short distances on high tides. During the winter when the rivers are frozen over, practically no transportation facilities are available to the larger portion of this valuable agricultural land.

Southeastern Alaska.--Southeastern Alaska is for the most part nonagricultural. It is more densely populated than are other regions, however, and limited areas at the heads of bays and on the tide flats are being utilized for the production of crops and livestock. Most of the small areas of land under cultivation are near towns which can be reached by small boats or from which roads have been built. The principal crops grown for the market are carrots, rutabagas, cabbages, potatoes, strawberries, and raspberries. There are about 400 head of dairy cattle in southeastern Alaska. The largest herds are located near towns. Milk produced in this region is bottled and supplied to the towns. Practically all feed for the animals is shipped from the States. Farmers who do not live near the towns are dependent upon native tide-flat grasses for forage for their livestock. The cost of clearing land in southeastern Alaska is prohibitive, and farming operations are therefore limited to home gardening, trucking, and producing hay on isolated grass-covered tide flats.

AGRICULTURAL EXPERIMENT STATIONS

Information and advice regarding crops and methods of farming suited to the different agricultural regions may be obtained from the agricultural experiment stations at Fairbanks, Matanuska, and Sitka.

